

II. **REMARKS**

The Office Action dated September 26, 2007, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

Claims 1 and 3-20 are pending.

By this amendment, claim 1 is amended. Support for the amendment to claim 1 is found in the originally filed claims and in the specification, for example, on page 2, lines 1-3. Applicants submit that no new matter has been added and respectfully request reconsideration and withdrawal of the pending rejection.

Rejection under 35 U.S.C. § 103(a)

Claims 1 and 3-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kruecke *et al.* (U.S. Patent No. 6,080,799) in view of Moore *et al.* (U.S. Patent No. 5,658,962). Applicants traverse the rejection.

Claim 1 of the presently claimed invention is directed to a "foaming agent composition for polymeric foams, consisting essentially of: HFC 365mfc from 5 to 8 parts by weight/100 part of polymeric foam; [and] one or more fluorinated compounds, liquid at room temperature and having boiling point from 50°C to 150°C, and having formula R'-R_f-R (I)... wherein R' is-(O)_{n0}-C_nF_{2n}H or -(O)_{n0}-C_nH_{2n+1}..., wherein the ratio by weight of the compounds of formula (I) to the HFC 365mfc ranges from 0.005:1 to 0.1:1" (present claim 1) (emphasis added).

Applicants submit that in contrast to the presently claimed invention, Kruecke *et al.* merely discloses "mixtures... [that] contain or consist of 50 to 99% by weight of 1,1,1,3,3-pentafluorobutane (HFC 365 mfc) and 1 to 50% by weight of at least one fluorinated

hydrocarbon selected from the group consisting of 1,1,1,2-tetrafluoroethane, 1,1,1,3,3-pentafluoropropane, 1,1,1,3,3,3-hexafluoropropane, and 1,1,1,2,3,3,3-heptafluoropropane" (Kruecke *et al.*, col. 1, lines 54-60) (emphasis added). Specifically, Kruecke *et al.* discloses that "the blowing agents may, if desired, contain fluorinated hydrocarbons such as 1,1,1,2-tetrafluoroethane, 1,1,1,3,3-pentafluoropropane, 1,1,1,3,3-pentafluorobutane, or 1,1,1,3,3,3-hexafluoropropane" (Kruecke *et al.*, col. 1, lines 32-36) (emphasis added).

Applicants disagree with the Examiner's assertion that Kruecke *et al.* discloses preparations of polyurethane foams prepared from blowing agent combinations of 1,1,1,3,3-pentafluorobutane, and/or other hydrofluorocarbons (HFCs), and/or other blowing agents as desired. Applicants submit that Kruecke *et al.* discloses mixtures consisting of:

- 50 to 90% by weight of HFC 365mfc; and
- 1 to 50% by weight of at least one fluorinated hydrocarbon selected from the group consisting of: 1,1,1,2-tetrafluoroethane (R 134a); 1,1,1,3,3-pentafluoroethane; 1,1,1, 3, 3, 3-hexafluoroethane; and 1,1,1,2,3,3,3-heptafluoroethane (R 227ea) (see Kruecke *et al.*, col. 1, lines 54-60).

As such, Applicants submit that Kruecke *et al.* discloses preparations of polyurethane foams prepared from blowing agent combinations of 1,1,1,3,3-pentafluorobutane, and other hydrofluorocarbons, since the amounts of the other HFCs is 1 to 50% (and therefore other HFCs are always present). Therefore, Applicants submit that Kruecke *et al.* is directed to foams prepared by using as blowing agents HFC mixtures, not HFC 365 mfc alone.

Applicants submit that Moore *et al.* does not cure the deficiencies of Kruecke *et al.* Rather, Applicants submit that Moore *et al.* merely discloses "omega-hydrofluoroalkyl ether

compounds [that]... can be used in applications where... CFCs, HCFCs or halons have been used, for example, as... blowing agents or cell size regulators in making polyurethane foam insulation" (Moore *et al.*, col. 4, lines 4-12) (emphasis added). Applicants submit that there is no teaching or suggestion in Moore *et al.* to use hydrofluoroether compounds with HFC compounds, much less HFC 365mfc, wherein "the ratio by weight of the compounds of formula (I) to the HFC 365mfc ranges from 0.005:1 to 0.1:1" (present claim 1).

Therefore, Applicants submit that one of ordinary skill in the art, based on the teachings of Kruecke *et al.* and Moore *et al.*, and without the benefit of hindsight, would not be motivated to modify the compositions of Kruecke *et al.* and Moore *et al.* to arrive at the presently claimed invention. In particular, Applicants submit that it is unclear how those of ordinary skill in the art, trying to improve the thermoinsulating properties of foams obtained by using HFC 365 mfc as a blowing agent, would be motivated to combine the HFC mixtures of Kruecke *et al.* with the hydrofluoroethers of Moore *et al.* Further, Applicants submit that Kruecke *et al.* and Moore *et al.* do not teach or suggest the presently claimed invention, as Kruecke *et al.* teaches a composition having HFC 365mfc and other HFCs, while Moore *et al.* discloses hydrofluoroethers. In other words, Applicants submit that even if the teachings of Kruecke *et al.* and Moore *et al.* could be combined, the result would be a composition having HFC 365mfc, hydrofluoroethers, and other HFCs, which is what is not presently claimed, a "composition... consisting essentially of: HFC 365mfc... [and] one or more fluorinated compounds [of formula (I)]" (claim 1) (emphasis added). As such, Applicants submit that there is no teaching or suggestion in either reference to remove the other HFCs from the composition disclosed in Kruecke *et al.*

In addition, regarding the Examiner's assertion that in present claim 1 "consisting

“essentially of” means “comprising,” Applicants submit that the present wording of claim 1 makes clear that the foaming agent composition consists essentially of HFC 365 mfc and a hydrofluoroether as therein defined. Applicants note that the hydrofluoroethers used in claim 1 in combination with HFC 365 mfc are not cell size modifiers, since the cell sizes of the polyurethane foams obtained with the compositions of the present invention are not substantially different from those of the polymeric foams obtained with HFC 365 mfc alone (see specification, page 13, lines 15-19). Applicants submit that the wording “consisting essentially of” would direct the skilled to exclude from the blowing compositions of present claim 1 any other blowing agent such as, for instance, those HFCs used in Kruecke *et al.* in admixture with HFC 365 mfc.

Additional Comments

Applicants submit that the technical problem of the presently claimed invention is to have available mixtures comprising HFC 365 mfc, to be used in substitution of HFC 141b, to obtain polymeric foams, in particular polyurethane foams, said foams showing improved properties as regards the maintenance in the time of the thermoinsulating properties (see specification, page 4, lines 17-22). As noted in the present specification on page 4, lines 9-15, it is already known that HFC 365 mfc can be used as a drop-in substitute for HFC 141b, but the drawback was that the thermoinsulating properties of the polymeric foams obtained with HFC 365 mfc alone decrease with time.

The compositions of the presently claimed invention show improved properties. For example, polyurethane foams prepared by using HFC 365 mfc in combination with the hydrofluoroethers of formula (I) of claim 1 show a lower thermal conductivity than the

polyurethane foam (comparative foam) obtained by using the blowing agent HFC 365 mfc alone (see Table II on page 24 of the specification). Table II also shows that the lower conductivity was maintained throughout the 35 days of the experiment. Applicants submit that these results are unexpected, as there is no teaching or suggestion in the cited references that polymeric foams prepared with a mixture of HFC 365 mfc and an hydrofluoroether of formula (I) could show a thermal conductivity lower than that of foams obtained by using as foaming agent HFC 365 mfc.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1 and 3-20 under 35 U.S.C. § 103(a) over Kruecke *et al.* and Moore *et al.*

III. **CONCLUSION**

In view of the amendments and remarks above, Applicants respectfully submit that this application is in condition for allowance and request favorable action thereon. Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' representatives at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. The Commissioner is authorized to charge payment for any additional fees that may be required with respect to this paper or credit any overpayment to Counsel's Deposit Account 01-2300, making reference to Attorney No. **108910-00121**.

Respectfully submitted,



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